IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of
WADA ET AL.
Serial No. 10/581,603
Filed: June 5, 2006

Conf. No.: 5465
Atty. Ref.: FPP-1035-641
TC/A.U.: 3761
Examiner: C.L. Anderson

For: WATER-ABSORBING AGENT, MANUFACTURE METHOD THEREOF, AND ABSORBENT AND ABSORBENT ARTICLE MADE THEREFROM

* *

August 20, 2010

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

Appellant hereby appeals to the Board of Patent Appeals and Interferences from the last decision of the Examiner.

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(I) REAL PARTY IN INTEREST

The real party in interest is Nippon Shokubai Co., Ltd., a corporation of Japan.

(II) RELATED APPEALS AND INTERFERENCES

The appellant and the undersigned are not aware of any related appeals, interferences, or judicial proceedings (past or present), which may be related to, directly affect or be directly affected by or having a bearing on the Board's decision in this appeal.

(III) STATUS OF CLAIMS

Claims 1-9 are pending and have been rejected.

Claims 10-14 are withdrawn.

Claims 1-9 are being appealed.

No claims have been allowed.

(IV) STATUS OF AMENDMENTS

No amendments have been filed subsequent to Final Rejection.

(V) SUMMARY OF CLAIMED SUBJECT MATTER

The only independent claim on appeal is Claim 1. Claims 2-8 depend from Claim 1, and Claim 9 depends from Claim 8.

Claim 1 and all of the dependent claims recite a water-absorbing agent, comprising a water-absorbing resin having a cross-linking structure constructed by polymerization of an unsaturated monomer component, wherein the water-absorbing agent is surface-treated (page 29, lines 20, 21), and meets all of the following properties:

(1) heat retention indicator 1 (maximum temperature decrease per minute 5 to 10 minutes after 10 times swelling in a 0.90 wt. % sodium chloride at 50°C) is from 0 to 3.0°C/min (page 34, lines 22-25);

(2) a centrifuge retention capacity in a 0.90 wt. % aqueous solution of sodium chloride (30 minute value) is 34 g/g or less (page 36, lines 11-13);

(3) an absorbency in a 0.90 wt. % aqueous solution of sodium chloride against a pressure of 2.0 kPa (60 minute value) is less than 30 g/g (page 36, lines 13-15); and

(4) a saline flow conductivity (SFC) for a 0.69 wt. % aqueous solution of sodium chloride is less than 20 x $10^{-7}$$cm^3$sec/g (page 36, lines 15-17).

Claim 2 is considered to be patentable separately from Claim 1 and further recites that the water-absorbing agent is particles (page 29, lines 16-19) and meets the following conditions:

particles having diameters from 600 to 300 μm as specified by sieve classification account for 60 wt.% or more, and those less than 150 μm account for 3 wt.% or less (page 7, lines 12-15; page 31, lines 3-5);

a standard deviation of logarithm ($\sigma\zeta$) of particle size distribution is from 0.250 to 0.400 (page 7, lines 16, 17; page 31, lines 20, 21).

Claim 4 is considered to be patentable separately from Claim 1 and further recites a heat retention indicator 2 (gel surface temperature 10 minutes after 10 times swelling in a 0.90 wt. % sodium chloride at 50°C) is 20°C or higher (page 35, lines 9-16).

Claim 5 is considered to be patentable separately from Claim 1 and further recites a heat retention indicator 3 (time taken by a gel surface temperature to return to 37°C after 10 times swelling in a 0.90 wt. % sodium chloride at 50°C) is 120 seconds or longer (page 35, lines 20-25; page 36, lines 1-8).

Claim 6 is considered to be patentable separately from Claim 1 and further recites a mass-average particle diameter (specified by sieve classification) is from 400 to 600 μm (page 31, lines 14-19).

(VI) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-9 are unpatentable under 35 U.S.C. 103(a) over the teachings of Sun et al. (hereinafter "Sun") (6514615) in view of Beihoffer et al. (hereinafter "Beihoffer") (6222091).

(VII) ARGUMENT

In order to establish a *prima facie* case of obviousness, all of the claim limitations must be taught or suggested by the prior art. It is submitted that the combined teachings of Sun and Beihoffer fail to teach or suggest the water-absorbing agent recited in Claims 1-9 and including the following properties:

(1) heat retention indicator 1 (maximum temperature decrease per minute 5 to 10 minutes after 10 times swelling in a 0.90 wt. % sodium chloride at 50°C) is from 0 to 3.0°C/min;

(2) a centrifuge retention capacity in a 0.90 wt. % aqueous solution of sodium chloride (30 minute value) is 34 g/g or less;

(3) an absorbency in a 0.90 wt. % aqueous solution of sodium chloride against a pressure of 2.0 kPa (60 minute value) is less than 30 g/g; and

(4) a saline flow conductivity (SFC) for a 0.69 wt. % aqueous solution of sodium chloride is less than 20 x $10^{-7}$$cm^3$sec/g.

As stated on pages 4-7 of the specification, the inventors have found that a drop in the temperature of the absorbent after a diaper or the like absorbent absorbs excreted urine or other body fluids, i.e., the "cool feel" of the wearer, is a factor that seriously affects comfort. In the manufacture and/or construction of such absorbents, heat retention has not been considered and thus none of them have achieved a satisfactory level of heat retention and actual use. Accordingly, it is important to provide high heat retention and also attain a required level of absorption performance.

The inventors have found that the heat retention of a diaper or the like can be enhanced by improving a particular capability of the water-absorbing resin, which has led to the present invention. This particular capability is measured by a "heat retention indicator 1" of the water-absorbing resin which is an absolutely novel parameter for a water-absorbing resin to be used in a water-absorbing agent. The heat retention indicator 1 is a representation of a temperature change on the surface of the water-absorbing resin over a unit time after a liquid is poured onto the water-absorbing resin. The lower the heat retention indicator 1, the smaller the temperature change on the water-absorbing resin surface and the better the heat retention. Accordingly, the inventors have found that a water-absorbing resin with a satisfactory heat retention indicator 1 can be prepared by controlling the centrifuge retention capacity, absorbency under pressure and saline flow conductivity during manufacture. This novel combination of properties, as set forth in Claim 1 and dependent Claims 2-9 is not disclosed or even suggested by the teachings of the cited references, taken individually or in combination. The cited references fail to teach a water-absorbing agent which exhibits excellent performance without an uncomfortable feeling when used as a diaper or the like, owing to the combination of the four properties set forth in the claims, namely, a heat retention indicator, a centrifuge retention capacity, an absorbency, and a saline flow conductivity.

The Examiner acknowledges that Sun fails to teach the saline flow conductivity and the heat retention indicator called for in all of the claims. Although Sun is silent as to the heat retention indicator of the water-absorbing agent, the Examiner takes the position

that, since Sun discloses an identical water-absorbing agent, the water-absorbing agent of Sun will inherently exhibit the claimed heat retention indicator.

The Examiner then combines the teachings of the secondary reference to Beihoffer which discloses a saline flow conductivity, with the teachings of Sun in an attempt to render obvious the novel combination of elements in Claims 1-9. It is noted, however, that neither Sun nor Beihoffer recognizes the importance of a heat retention indicator in combination with a required level of absorption performance in a water-absorbing agent. There is no basis, therefore, for combining the teachings of Beihoffer with Sun in an attempt to render obvious the novel recitations in Claims 1-9, particularly, the combination of the four properties in Claim 1, namely, heat retention indicator, centrifuge retention capacity, absorbency and saline flow conductivity. The importance of the combination of these elements is not recognized in Sun or Beihoffer taken alone or in combination.

Beihoffer discloses in Claim 11 a saline flow conductivity value of greater than $15 \times 10^{-7} cm^3 sec/g$ in a superabsorbent material comprising multicomponent superabsorbent particles wherein each particle comprises at least one microdomain of an acidic water-absorbing resin in contact with at least one microdomain of a basic water-absorbing resin. This superabsorbent material differs significantly from the superabsorbent polymer disclosed in the Sun reference and there is nothing in either of these references to suggest their combination, particularly with respect to a heat retention indicator, as specifically recited in Claims 1-9. There is clearly no teaching or even a

suggestion in Sun or Beihoffer of the significance of a heat retention indicator or of a reason to combine their teachings to obtain a desired heat retention indicator.

In the Final Office Action, the Examiner states that Applicants' arguments fail to explain why the heat retention indicator 1 is not inherent to the resin and do not explain what factors result in the heat retention indicator 1 and why the resin disclosed by Sun would not exhibit the claimed heat retention indicator. It is noted that the Examiner, not the Applicants, has the burden of establishing a *prima facie* case of obviousness. In the present application, Applicants have clearly described and claimed the novel combination of elements in the new and improved water-absorbing agent and the fact that a water-absorbing resin with a satisfactory heat retention indicator 1 can be prepared by controlling the centrifuge retention capacity, absorbency under pressure and saline flow conductivity during manufacture. It is obvious that the Examiner has clearly failed to establish why on a *prima facie* basis the novel combination of elements in Claims 1-9 would be obvious in view of the combined teachings of Sun and Beihoffer. If the Examiner does not establish a *prima facie* case of obviousness, it is not the burden of the Applicants to establish non-obviousness.

In paragraph 7 of the Final Office Action, the Examiner states that the temperature change on the surface of the water-absorbing resin is inherent to the water-absorbing resin, with the result that the water-absorbing agent of Sun will inherently exhibit the claimed heat retention indicators. This abstract statement clearly fails to establish why the novel combination of elements in Claims 1-9 would be obvious in view of the combined teachings of Sun and Beihoffer. There is no disclosure or suggestion in either

of these references that a water-absorbing resin with a satisfactory heat retention indicator can be prepared by controlling the centrifuge retention capacity, absorbency under pressure and saline flow conductivity, as recited in all of the claims.

With respect to Claims 2 and 6, the Examiner alleges that Sun discloses a water-absorbing agent having the claimed particle diameters. It is noted, however, that column 5, lines 41-44 of Sun merely states that a typical particle sized distribution ranges between about 20 and about 2000 micrometers, preferably between about 40 and about 890 micrometers, and more preferably between about 90 and about 850 micrometers. There is clearly no disclosure in Sun of the specific recitation in Claim 2 that the particles having diameters from 600 to 300 μm as specified by sieve classification account for 60 wt.% or more, and those less than 150 μm account for 3 wt.% or less, and a standard deviation of logarithm ($\sigma\zeta$) of particle size distribution is from 0.250 to 0.400. Also, Sun fails to disclose the specific recitation in Claim 6 of the mass-average particle diameter (specified by sieve classification) being from 400-600 μm.

With respect to Claim 4, there is no disclosure or suggestion in Sun or any other reference of the heat retention indicator 2 (gel surface temperature 10 minutes after 10 times swelling in a 0.90 wt. % sodium chloride at 50°C) being 20°C or higher.

With respect to Claim 5, there is clearly no disclosure or suggestion in Sun or any other reference of the heat retention indicator 3 (time taken by a gel surface temperature to return to 37°C after 10 times swelling in a 0.90 wt. % sodium chloride at 50°C) being 120 seconds or longer.

It is submitted that the novel combination of elements in Claims 1-9 in order to obtain the desired heat retention indicator clearly is not shown or even suggested by the references cited by the Examiner. The Examiner has failed to establish a *prima facie* case of obviousness and has failed to show that there is any objective suggestion or motivation in the prior art references relied upon, or in the knowledge available to one skilled in the relevant art at the time of the invention, to apply the references in the manner done so by the Examiner in rejecting Applicants' claims. It is only through hindsight, having the benefit of Applicants' disclosure, that the Examiner could apply the teachings of the references in the manner set forth in the final rejection.

CONCLUSION

In view of the arguments set forth herein, it is submitted that the present application is in condition for allowance, and the rejections by the Examiner of Claims 1-9 are clearly in error. Accordingly, it is requested that the Examiner's decision finally rejecting Claims 1-9 be reversed.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: Frank P. Presta

Frank P. Presta
Reg. No. 19,828

FPP:cgp
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100

(VIII) CLAIMS APPENDIX

1. A water-absorbing agent, comprising a water-absorbing resin having a crosslinking structure constructed by polymerization of an unsaturated monomer component, wherein

the water-absorbing agent is surface-treated, and

the water-absorbing agent meets all of properties (1) through (4):

(1) heat retention indicator 1 (maximum temperature decrease per minute 5 to 10 minutes after 10 times swelling in a 0.90 wt. % sodium chloride at 50°C) is from 0 to 3.0°C/min;

(2) a centrifuge retention capacity in a 0.90 wt. % aqueous solution of sodium chloride (30 minute value) is 34 g/g or less;

(3) an absorbency in a 0.90 wt. % aqueous solution of sodium chloride against a pressure of 2.0 kPa (60 minute value) is less than 30 g/g; and

(4) a saline flow conductivity (SFC) for a 0.69 wt. % aqueous solution of sodium chloride is less than 20 x $10^{-7}cm^3sec/g$.

2. The water-absorbing agent as set forth in claim 1, wherein

the water-absorbing agent is particles, and

the water-absorbing agent meets following conditions:

particles having diameters from 600 to 300 μm as specified by sieve classification account for 60 wt. % or more, and those less than 150 μm account for 3 wt. % or less; and

a standard deviation of logarithm ($\sigma\zeta$) of particle size distribution is from 0.250 to

0.400.

3. The water-absorbing agent as set forth in claim 1, further comprising water-insoluble inorganic fine particles, besides the water-absorbing resin.

4. The water-absorbing agent as set forth in claim 1, wherein a heat retention indicator 2 (gel surface temperature 10 minutes after 10 times swelling in a 0.90 wt. % sodium chloride at 50°C) is 20°C or higher.

5. The water-absorbing agent as set forth in claim 1, wherein a heat retention indicator 3 (time taken by a gel surface temperature to return to 37°C after 10 times swelling in a 0.90 wt. % sodium chloride at 50°C) is 120 seconds or longer.

6. The water-absorbing agent as set forth in claim 1, wherein a mass-average particle diameter (specified by sieve classification) is from 400 to 600 μm.

7. The water-absorbing agent as set forth in claim 1, further comprising polyol, besides the water-absorbing resin.

8. An absorbent, comprising the water-absorbing agent as set forth in claim 1 and hydrophilic fibers.

9. An absorbent article, comprising the absorbent as set forth in claim 8; a liquid-permeable top sheet; and a liquid-impermeable back sheet.

(IX) EVIDENCE APPENDIX

None.

(X) RELATED PROCEEDINGS APPENDIX

None.